

Radiative correction in QED in a Lorentz violating background

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Abstract content

Summary

Radiative corrections in Lorentz violating extensions of QED have raised some controversies due to possible ambiguous results, mostly by the different results that can be found in the literature, for a given physical quantity. However, some of these results rely on arguments which are known to hold in Lorentz invariant theories but certainly may not be at hand in the present context to begin with. As a case of study, in this talk I will address the case of fermions coupled to a constant background axial vector and analyse both classical and quantum aspects which prove to be relevant for the consistence of the theory. The modification of the mass-shell conditions in the free theory allows to determine certain bounds on the fermions' momenta which in turns determines the domain of integration for radiative corrections. We consider this to render the theory free of ambiguities, rather than formal arguments which may lack foundation in this context. Also, the appearance of an anomalous loss of gauge invariance, the role of finite temperature and the implications of different regularisations to deal with divergent quantities are mentioned.

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